Date of Issue:
12 March 2014

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 1633c
SRM Name: Trace Elements in Coal Fly Ash
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for use in the evaluation of analytical methods for the determination of constituent elements in coal fly ash or materials of a similar matrix. SRM 1633c is a bituminous coal fly ash that was sieved through a nominal sieve opening of 74 µm (200 mesh) and then blended to assure homogeneity. A unit of SRM 1633c consists of 75 g of powdered material.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Note: This material is a complex mixture that contains respirable crystalline silica as quartz. The health and physical hazard information provided in this SDS contains the effects associated with the inhalation of quartz particulates at a concentration ≥1 %.

Classification

Physical Hazard: Not classified.
Health Hazard: Carcinogen Category 1
STOT, Repeated Exposure Category 1

Label Elements
Symbol

Signal Word
DANGER

Hazard Statement(s):

H350	May cause lung cancer.
H372	Causes damage to lungs through prolonged or repeated inhalation.

Precautionary Statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, and eye protection.
P308 + P313	If exposed or concerned: Get medical attention.

P405 Store locked up.

P501 Dispose of contents and container in accordance with local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Coal ashes, (residues)

Other Designations: Coal fly ash (ash; coal ash; fly ash; flyash; coal ash, by product; bottom ash)

This material is a complex mixture that has not been tested as a whole and contains trace amounts of compounds which have been reported to have toxic, mutagenic, and/or carcinogenic properties, and should be handled with care, including nickel, vanadium, and chromium compounds. Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Coal fly ash	68131-74-8	268-627-4	<99.0
Quartz	14808-60-7	238-878-4	>1.0

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. Thoroughly clean and dry contaminated clothing before reuse.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If adverse effects occur after ingestion, seek medical treatment.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation, lung damage, silicosis, and cancer.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:
Suitable: Regular dry chemical, dry sand, water, and regular foam.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 1 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers. Keep unnecessary people away, isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: Minimize dust generation. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handling in accordance with all current regulations and standards. Keep separated from incompatible substances (oxidizing materials, bases, halogens, acids, metal salts, metals, combustible materials).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Coal fly ash:

OSHA (PEL): No exposure limits available.

NIOSH (REL): 0.015 mg/m^3 (TWA) [except Nickel carbonyl, as Ni, related to Nickel compounds]
10 mg/m^3 (IDLH) [except Nickel carbonyl, as Ni, related to Nickel compounds]

Quartz:

ACGIH (TLV): 0.025 mg/m^3 (TWA) [respirable fraction]

OSHA (PEL): (30)/(%SiO2 + 2) mg/m^3 (TWA) [total dust]
(250)/(%SiO2 + 5) mppcf (TWA) [respirable fraction]
(10)/(%SiO2 + 2) mg/m^3 (TWA) [respirable fraction]

NIOSH (REL): 0.05 mg/m^3 (TWA) [respirable dust]
50 mg/m^3 (TWA) [respirable dust]

Note: The exposure limits listed take into consideration hazards associated with this material and are sufficient to protect against trace concentrations of vanadium and chromium (hexavalent chromium) compounds present.

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:	**Coal Fly Ash**
Appearance (physical state, color, etc.):	grey to black granular powder
Molecular Formula:	varies
Molar Mass (g/mol):	varies
Odor:	not available
Odor threshold:	not available
pH:	not applicable
Evaporation rate:	not applicable
Melting point/freezing point (ºC):	not available
Relative Density (g/L):	not available
Vapor Pressure (mmHg):	not applicable
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	0.5 % (water)
Partition coefficient (n-octanol/water):	not available
Particle Size (if relevant):	<74 μm

Thermal Stability Properties:	**Coal Fly Ash**
Autoignition Temperature (°C):	not applicable
Thermal Decomposition (°C):	not applicable
Initial boiling point and boiling range (°C):	not applicable
Explosive Limits, LEL (Volume %):	not applicable
Explosive Limits, UEL (Volume %):	not applicable
Flash Point (°C):	not applicable
Flammability (solid, gas):	slight

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

Incompatible Materials: Oxidizing materials, bases, halogens, acids, metal salts, metals, combustible materials.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation _____ Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: May cause irritation, lung damage, silicosis, and cancer.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Inhalation of dust may cause coughing, sneezing, upper respiratory tract irritation, and lung damage. Chronic exposure to fine particles containing respirable quartz may result in lung damage, silicosis, and cancer.

Skin Contact: May cause mechanical irritation.

Eye Contact: May cause mechanical irritation.

Ingestion: No data available.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.
Coal fly ash, Rat, Oral LD50: >2000 mg/kg
Quartz, Rat, Oral LD50: 500 mg/kg

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.
Fly ash containing chromium and nickel compounds has an irritant and allergic potential; only trace amounts of these compounds are present in this material

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 1

Listed as a Carcinogen/Potential Carcinogen X Yes _____ No
Silica, crystalline quartz is listed as Group 1, carcinogenic to humans by IARC, known human carcinogen (respirable size) by NTP, and is not listed by OSHA as a designated carcinogen.

Reproductive Toxicity: Not classified.
Coal fly ash, Rat, Intratracheal LDLo: 600 mg/kg (pregnant 14 d to 19 d)
Quartz: No data available.

Specific Target Organ Toxicity (STOT), Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity (STOT), Repeated Exposure: Category 1
Cumulative exposure to silica dust may result in reduced lung capacity and silicosis.

Aspiration Hazard: Not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Coal fly ash: Invertebrate, water flea (*Daphnia magna*) EC50: 140 mg/L to 2000 mg/L (24 h)

Quartz: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:
California Proposition 65: WARNING! This product contains a chemical (quartz) known to the state of California to cause cancer.

U.S. TSCA Inventory: Coal fly ash and quartz are listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:
WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 12 March 2014

Sources: ChemAdvisor, Inc., MSDS *Fly Ash*, 17 June 2013.

ChemAdvisor, Inc., MSDS *Quartz*, 17 June 2013.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NIST	National Institute of Standards and Technology
ALI	Annual Limit on Intake	NRC	Nuclear Regulatory Commission
CAS	Chemical Abstracts Service	NTP	National Toxicology Program
CEN	European Committee for Standardization	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
CPSU	Coal Mine Dust Personal Sample Unit	REL	Recommended Exposure Limit
DOT	Department of Transportation	RM	Reference Material
EC50	Effective Concentration, 50 %	RQ	Reportable Quantity
EINECS	European Inventory of Existing Commercial Chemical Substances	RTECS	Registry of Toxic Effects of Chemical Substances
EPCRA	Emergency Planning and Community Right-to-Know Act	SARA	Superfund Amendments and Reauthorization Act
IARC	International Agency for Research on Cancer	SCBA	Self-Contained Breathing Apparatus
IATA	International Air Transportation Agency	SRM	Standard Reference Material
IDLH	Immediately Dangerous to Life and Health	STEL	Short Term Exposure Limit
ISO	International Organization for Standardization	STOT	Specific Target Organ Toxicity
LC50	Lethal Concentration, 50 %	TDLo	Toxic Dose Low
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
MSHA	Mine Safety and Health Administration	UEL	Upper Explosive Limit
NIOSH	National Institute for Occupational Safety and Health	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.